

Modeling and Controls for Synthetic Jet-Based Active Flow Control, Phase I

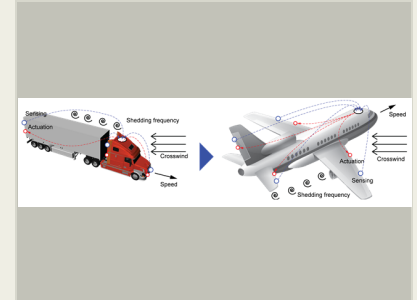
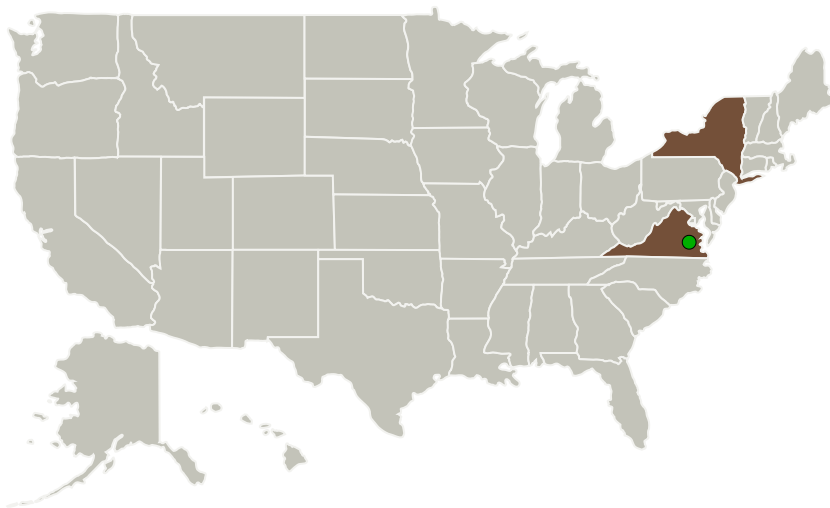
Completed Technology Project (2017 - 2017)



Project Introduction

In order to enable widespread application of Active Flow Control (AFC) technology on commercial transports, Actasys Inc, in collaboration with The Center for Advanced of Multifunctional Material Systems at University of California, Los Angeles (CAMMS-UCLA) and the Princeton University, intend to develop a model-based environment for the advancement of design and performance validation of AFC using Synthetic Jet actuators (AFCSJ). The core of this approach is establishing a feedback loop between new computational models, lab tests and field experiments in order to mature AFC actuation system design in a time-efficient and cost-effective and ready-implementable manner. This is a significant improvement on the current prevailing approach of iterative build-and-test for AFC development. Phase I will result in computational tools for modeling the performance of Synthetic Jet Actuators (SJA) resulting in optimized performance; Control loops which increase system energy efficiency; and a Data Management Platform (DMP) for test bed result analysis. Phase II will result in full- scale system validation in lab and field tests. Field demonstration of the system capabilities will use phase I outputs and will be performed using a previously developed full-scale tractor-trailer test bed in order to reduce risk and cost compared to flight-testing.

Primary U.S. Work Locations and Key Partners



Modeling and Controls for Synthetic Jet-Based Active Flow Control, Phase I Briefing Chart Image

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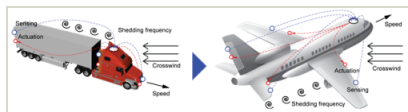


Organizations Performing Work	Role	Type	Location
Actasys, Inc.	Lead Organization	Industry	Loudonville, New York
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations

New York	Virginia
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Images



Briefing Chart Image

Modeling and Controls for Synthetic Jet-Based Active Flow Control, Phase I Briefing Chart Image
(<https://techport.nasa.gov/image/128280>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Actasys, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

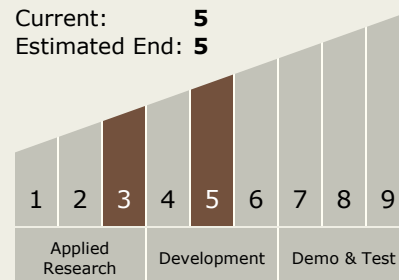
Carlos Torrez

Principal Investigator:

Michael D Menicovich

Technology Maturity (TRL)

Start: 3
Current: 5
Estimated End: 5



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Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - └ TX15.1 Aerosciences
 - └ TX15.1.5 Propulsion Flowpath and Interactions

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System